BIAMP®

Vocia®

LSI-16/LSI-16e

Operation Manual

1) Read these instructions.

2) Keep these instructions.

3) Heed all warnings.

4) Follow all instructions.

WARNING - To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

5) Do not use this apparatus near water.

6) Clean only with dry cloth.

7) Do not block any ventilation openings. Install product in accordance with the manufacturer's instructions.

8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

CAUTION – Installation of the apparatus should be made by a qualified installation person and should conform to all applicable local codes.

Modifications and optional equipment information referenced in this manual is for use by qualified installation and service personnel only.

WARNING – Class I Safety Grounding
This apparatus employs Class I Safety Grounding and must be connected to a MAINS socket with a protective eathing connection.

Disconnect Device - The MAINS plug is used to disconnect MAINS power and must remain readily operable.

9) Do not defeat the safety purpose of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11) Only use attachments/accessories specified by the manufacturer.

12) Use only when secured or supported by equipment rack, cart or table designed to provide adequate mechanical strength, heat dissipation and securement to the building structure.

When a cart is used, use caution when moving the cart / apparatus combination to avoid injury from tip-over.

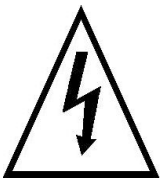
13) Unplug this apparatus during lightning storms or when unused for long periods of time.

14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Explanation of safety related symbols which appear on the outside of the apparatus.

Product labeling and the operation manual may use the internationally recognized symbols defined below to note safety messages.

Lightning Bolt: Hazardous Live voltages present when this unit is in operation. Do not touch terminals marked with this symbol while the unit is connected to live power.



Exclamation Point: Replace components (i.e. fuses) only with the values specified by the manufacturer. Failure to do so will compromise safe operation of this unit.

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VOCIA LIFE SAFETY INTERFACE 16 (LSI-16/LSI-16e)

The LSI-16/LSI-16e are networked devices that serve as an interface between a Vocia system and emergency or fire alarm systems. The LSI-16/LSI-16e may accept up to three sources of power: main power is from an external, standards compliant, battery backed 24V DC source but the LSI-16/LSI-16e can also utilize Power over Ethernet (PoE) delivered via either of its two network ports. The device is equipped with parallel I/O ports for direct interface to fire and emergency control equipment. The LSI-16/LSI-16e uses Ethernet-based control protocols to function within a Vocia system.

LSI-16 FEATURES

- Parallel I/O ports for direct interface with fire alarm and emergency equipment
- 8 monitored I/O and 8 control inputs
- Redundant network connection and power supply options
- Power and data over a single Ethernet cable
- Local storage of configuration data
- Rotary switches for unit identification
- Accepts the Interface Module 16 (IM-16) for 16 additional general purpose inputs
- Status LEDs
- Rack mountable (1RU)
- CE marked and RoHS compliant
- Up to 4 discrete emergency inputs
- Up to 500 virtual inputs via RS232 port or Ethernet
- EN 54-16 certified
- EN 60849 and AS 60849 verified
- Covered by Biamp Systems' warranty

LSI-16e FEATURES

- Parallel I/O ports for direct interface with fire alarm and emergency equipment
- 8 monitored I/O and 8 control inputs
- Redundant network connection and power supply options
- Power and data over a single Ethernet cable
- Local storage of configuration data
- Rotary switches for unit identification
- Up to 4 discrete emeregency inputs
- 16 additional general purpose inputs can be programmed to play an emergency message, enable zone reset or zone silence; maximum of 10 inputs can be assigned per emergency zone
- Each general purpose input can be programmed as TTL, high range or monitored high range
- General purpose inputs allow monitoring for short to ground and open circuit
- Up to 500 virtual inputs via RS232 port or Ethernet
- Provides system health monitoring via RS232 port or Ethernet
- Status LEDs
- Rack mountable (1RU)
- CE marked and RoHS compliant
- EN 54-16 certification pending
- Covered by Biamp Systems' warranty

Setup and Use

The Vocia software provides an intuitive interface for configuration and programming of the LSI-16/LSI-16e. The information supplied by this manual relates to physical connections and assignment. For more details on configuration of the LSI-16/LSI-16e, please consult the Vocia software Help File.

The LSI-16/LSI-16e governs the emergency functions of a Vocia system, monitoring and reporting faults and alarm conditions through indicators and the system software. Incorrect configuration, removal, or non-installation of some system elements may result in the LSI-16/LSI-16e reporting a fault or alarm condition. This is normal operation. For correct, fault-free operation, inputs and outputs must be connected to the LSI-16/LSI-16e as detailed below, the LSI-16/LSI-16e must detect that it is the only such device installed in the Paging World, and the system must be correctly configured and correctly operating.

Front Panel

The LSI-16/LSI-16e features twenty-three LEDs on the front plate (from left to right):

(LED 1) Power

The first LED on the left will illuminate green if the unit is powered by main or PoE supplies.

(LED 2) General Alarm

This LED will illuminate red if the LSI-16/LSI-16e receives an alarm signal from an external emergency detection system (e.g. a fire alarm system) via the Alarm inputs to the LSI-16/LSI-16e. This LED indicates the general alarm state:

1. Solid red - The LSI-16/LSI-16e has received an alarm signal from an external emergency detection system (e.g. fire alarm system).
2. Flashing red - The LSI-16/LSI-16e has received a general alarm silence from an external emergency detection system (e.g. fire alarm system).

(LED 3) General Fault

This LED will illuminate yellow if there is a fault in the system that does not affect the delivery of a warning message.

(LED 4) Power Supply Fault

This LED will illuminate yellow if LSI-16/LSI-16e is operating on a PoE supply but the main 24V supply fails or an external power supply fault is signaled to the LSI-16/LSI-16e.

(LED 5) Protection Fault

This LED will illuminate yellow if a system amplifier channel fails and this failure does not prevent an emergency zone voice announcement. Note: failures that do affect emergency zone voice announcements will result in a system fault.

(LED 6) Path Fault

This LED will illuminate yellow if a fault in a transmission path is detected. The path integrity is tested from microphone capsule to end of loudspeaker lines if optional Vocia ELD-1 devices are fitted at the end of the loudspeaker lines.

(LED 7) System Fault

This LED indicates the integrity of the system:

1. Flashing yellow - The unit has a fault that may prevent the reliable operation of life safety announcement functions.
2. Not illuminated - The unit is operational without any faults that may prevent reliable operation of life safety announcement functions.

(LED 7) System Fault *(continued)*

Because it indicates a potentially serious condition, the presence of a System Fault extinguishes indicators for PSU, Path and Protection faults so as to focus attention on the primary fault. However, individual PSU, Path and Protection faults are still shown in the system software and signaled to individual fault outputs as described below.

The LSI-16/LSI-16e will always power up in the system fault condition. Manual intervention is required to take the LSI-16/LSI-16e out of this condition. Note: this power up condition does not prevent emergency zone voice announcements provided that the system is operating reliably.

(LEDs 8–23) General Purpose LEDs

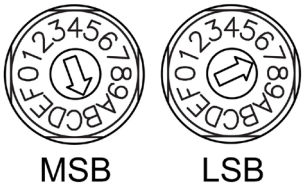
These LEDs indicate functionality of the general purpose inputs on the LSI-16e or of the LSI-16 that has been updated with an Interface Module 16 (IM-16). On an LSI-16 without an option board, these LEDs remain inactive.

- Solid Red: An Alarm is active on the associated input.
- Solid Yellow: A Fault is active on the associated input.
- Flashing Yellow: An input configured as “high range - monitored” exhibits a monitoring fault.

Device ID

The rotary ID switches are located on the back of the LSI-16/LSI-16e and give the unit a unique Device ID. The switches are in hexadecimal format. To assign a Device ID of hex 07, turn the LSB switch to 7 and leave the MSB switch on 0. To create an ID of hex B7, turn the LSB switch to 7 and turn the MSB switch to B. Device ID switches should be set using a 0.1 inch (2.5mm) to 0.12 inch (3.0mm) flat blade screwdriver. More information on setting IDs and the hexadecimal numbering scheme used in Vocia can be found in the Vocia Help File.

Please note: Changes made to the Device ID while connected to the network require a power cycle in order to take effect.



Network Connection

The LSI-16/LSI-16e has two RJ45 Ethernet connectors. These provide redundant network capability as well as a secondary source of power (PoE). If communication is lost on either Ethernet port, the LSI-16/LSI-16e reports a fault. For this reason, both Ethernet ports must be connected to the Vocia network. To provide Auxiliary power PoE should be supplied to both Ethernet ports. An LED adjacent to each RJ45 connector indicates that PoE is being supplied via that port.

The RJ45 connectors utilize standard copper Ethernet cabling to interface the LSI-16/LSI-16e to the Vocia system via a PoE-compliant network switch. The RJ45 connector provides two LEDs that indicate Ethernet link and network activity (see table below).

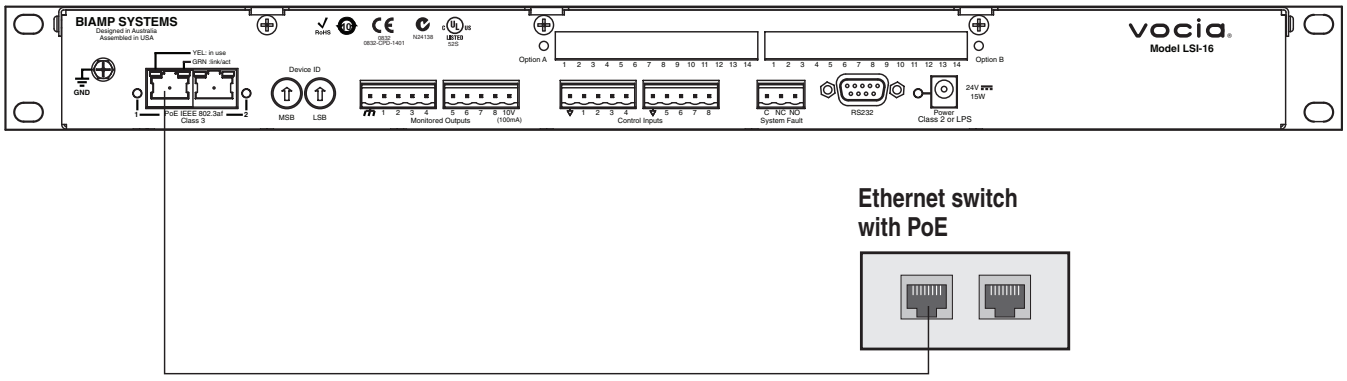
Left LED	Right LED	Description
None	None	No power or data connectivity. Please check the PoE network connection.
Yellow	Flashing green	Network link established and indicates the port is currently in use.
Yellow	None	There is a network link but the port is redundant.

This connection carries control data and power over a single Ethernet cable. The maximum distance between any unit and an Ethernet switch is 328 feet (100 meters) when using copper cabling. Additional Ethernet switches and/or fiber-optic cable can be used to further extend distances between units on a network. Note: A managed Ethernet switch is required for redundant network wiring (spanning-tree configuration or similar).

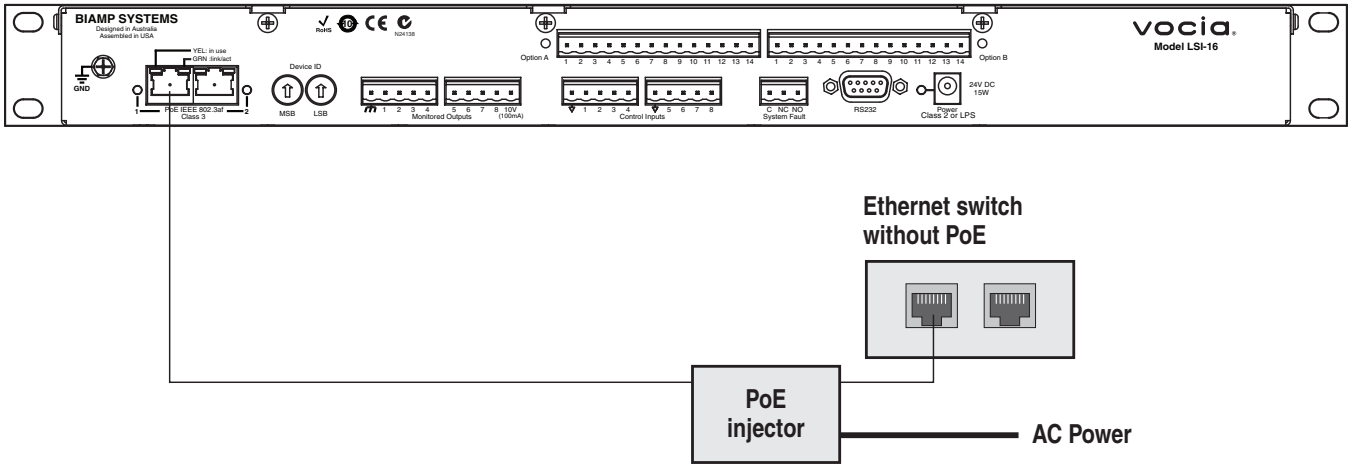
If non-Vocia network traffic shares an Ethernet switch with the Vocia network, separate VLANs must be established. All Ethernet wiring must be accomplished using shielded CAT5, CAT5e, CAT6 or CAT7 cable.

For standards-compliant systems, a managed switch with dry contact fault output is required.

LSI-16



LSI-16e



Monitored I/O

Two black five-position connectors are located next to the rotary switches. These are predominantly used for monitored inputs and outputs (I/O) to external lamps or sounders. Individual connections are labeled 1 through 8 as indicated below. One connection is configured for use as both an input and an output (1) and one as an input (2) (see table below for connector assignments).

Marking	Function
⏚	Ground
1	Sounder Output / Silence Input
2	System Fault Reset Input
3	Voice Alarm Active
4	General Fault
5	PSU Fault
6	Protection Fault
7	Path Fault
8	External Supply Over-voltage Monitor
10V	10V Out

The inputs/outputs will sink current (pull low) when active (see the Specifications section of this document for more details). The desired load (lamp, LED, etc.) must be connected between the input/output terminal and a positive voltage reference.

It should be noted that external switches and a sounder connected to the first two inputs are typically mandatory for standards compliance. The location and physical attributes of these items may be required to conform with local norms. The switches and sounder must be wired according to the connection diagram provided below.

For each of these inputs/outputs, a load must be connected between each output and the positive voltage source. If any output on terminals 1 through 8 is unused, the output must be connected through an external resistor to the positive side of the voltage source (either 10V Out or user-supplied external source). To ensure correct functionality, the value of each resistor should be 22kΩ. An internally derived 10V source is provided at the 10V Out terminal; however, the total current available from this pin is limited to 100mA. This voltage source may be used for external devices provided the total load is less than 100mA. For higher-current devices, a user-supplied external voltage source of up to 35V may be used, with the negative side connected to the pin. Due to monitoring constraints, it is impossible to use both the internal 10V source and an external source. For monitoring purposes, the positive side of the voltage source (either 10V Out or user-supplied external source) must be connected to the External Supply Over-voltage Monitor (terminal 8), as well as supplying voltage to external devices.

(I/O 1) Sounder Output/Silence Input

This connection functions as a dual purpose alarm sounder output and silence input (see connection diagram below).

Sounder Output

This output connects to a local sounder for fault and alarm warnings. A sounder is typically required for standards compliance.

Note: If an emergency microphone is located near the sounder, it may be configured in Vocia software to mute the sounder while making live announcements.

Silence Input

This input is used to silence the local sounder. The sounder will restart in response to any new fault or alarm.

(I/O 2) System Fault Reset Input

This input is required to take the LSI-16/LSI-16e out of System Fault condition. Note: the LSI-16/LSI-16e will always power up in a system fault state (see connection diagram).

(I/O 3) Voice Alarm Active

This output is active when messages are playing in response to an alarm input. This output provides indication of when a message is playing or when a message has been muted.

Constant active output - indicates a message is playing in response to an alarm input.

Cyclic output (1.25Hz) - indicates the message has been muted.

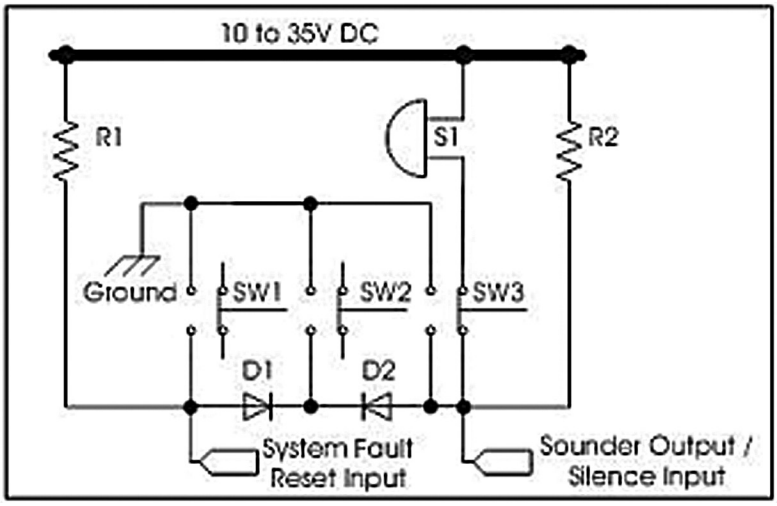
(I/O 4-7) General Fault, PSU Fault, Protection Fault and Path Fault

These outputs will be activated by the same alarm conditions as identically named LEDs on the front panel (described above). Note however that these outputs will be activated by the faults listed above irrespective of whether a System Fault has been activated.

The Voice Alarm Active, General Fault, PSU Fault, Protection Fault and Path Fault outputs are monitored for open-circuit or short-circuit to ground or power supply and for over-voltage on the output pin (>35V DC). If incorrect conditions are detected a Fault is signaled. Output monitoring facilitates compliance with voice evacuation standards.

System Test

A system test can be initiated by simultaneously connecting monitored outputs 1 and 2 to ground (see connection diagram). A system test runs a diagnostic test, part of which illuminates each LED in turn and momentarily activates the sounder.



Connection Diagram: external switches and sounder (Note: 10V supply may be derived from the LSI-16/LSI-16e Outputs Connector)

SW1	System Fault Reset (e.g. EAO 31-453 or equivalent switch)
SW2	System Test (e.g. EAO 31-453 or equivalent switch)
SW3	Silence Local Sounder (e.g. EAO 31-453 or equivalent switch)
D1 and D2	1N4004 or equivalent general purpose 1A diode
R1 and R2	22kΩ 0.25 watt resistor
S1	Piezo (or similar) sounder - tone and sound pressure level may be required to comply with local norms

Control Inputs

Two five-position plug-in barrier strip connectors provide control input connections. Eight separate channels plus two ground pins are provided (see table below for connector assignments). Control inputs are fully isolated from all connections in the LSI-16/LSI-16e.

Marking	Function
⏚	Ground
1	PSU Fault (contact closure indicates a PSU Fault)
2	Ethernet Fault
3	Voice Alarm Silence from CIE (common for all zones)
4	Voice Alarm Reset from CIE (common for all zones)
⏚	Ground
5	Emergency Input 1
6	Emergency Input 2
7	Emergency Input 3
8	Emergency Input 4

Input Activation Conditions

Control Inputs 1 and 2

To activate an input, it must be connected to an external circuit that returns to either of the two ⏚ pins. The resistance of this circuit must be less than 4kΩ.

Control Inputs 3 to 8

These inputs must be permanently connected to an external circuit that returns to either of the two ⏚ pins. The resistance of this circuit must be between 1kΩ and 4kΩ. To activate an input, pull the input to a voltage between 12 and 24V.

(Input 1) PSU Fault

This input may be derived from the primary 24V power supply to indicate to the LSI-16/LSI-16e if there is a fault in the power supply. This may be required for standards compliance.

(Input 2) Ethernet Fault

This input can be derived from an Ethernet switch to monitor the Ethernet network connection between the LSI-16/LSI-16e and amplifier. This may be required for standards compliance.

(Input 3) Voice Alarm Silence from CIE (fire alarm system)

This input is a signal from the CIE (fire alarm system) that will mute emergency messages in all emergency zones.

(Input 4) Voice Alarm Reset from CIE (fire alarm system)

This input is a signal from the CIE (fire alarm system) that will reset emergency messages in all emergency zones.

(Inputs 5-8) Emergency Inputs

These four inputs are used to connect to the fire alarm control and indicating equipment (CIE) and notify the LSI-16/LSI-16e that an alarm has occurred on a particular zone. Four such zone inputs may be connected; one emergency message or mute can be assigned per zone. Additional zone inputs are available with the IM-16. When an alarm is detected, the Vocia system will enter Emergency Mode as configured for that input. During Emergency Mode, some or all of the Vocia system will cease normal operation and operate as programmed for the emergency.

General Purpose Inputs

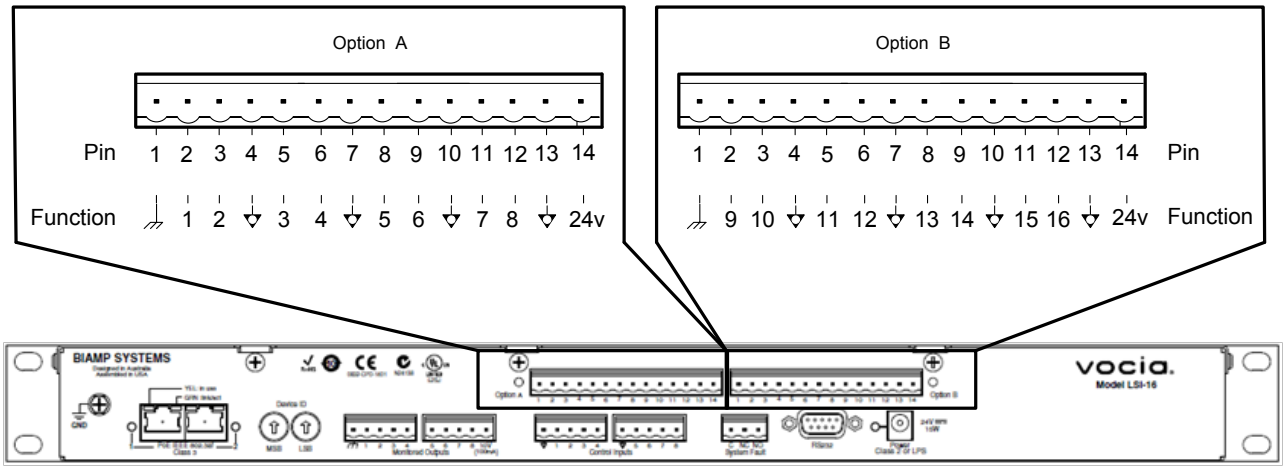
These connections provide functionality of the option inputs on the LSI-16e or of the LSI-16 that has been upgraded with an Interface Module (IM-16). On an LSI-16 without an option board, these connections will remain inactive.

Two connectors, labeled Option A and Option B, are located on the back of the LSI-16e. Each slot consists of 14 pins which are labeled 1 to 14. Each connector bank allows for the following connection:

- Chassis Ground: One connection per connector bank.
- Isolated Ground: Four connections per connector bank.
- Control Inputs: Eight connections per connector bank.

24 Volts DC - One output per connector. Internally sourced, this will allow up to 60mA to be shared over all general purpose inputs.

Pin-out



Pin	Option A Function	Option B Function
1	Chassis Ground/Shield	Chassis Ground/Shield
2	General Purpose Input 1	Control Input 9
3	General Purpose Input 2	Control Input 10
4	Isolated Ground	Isolated Ground
5	General Purpose Input 3	Control Input 11
6	General Purpose Input 4	Control Input 12
7	Isolated Ground	Isolated Ground
8	General Purpose Input 5	Control Input 13
9	General Purpose Input 6	Control Input 14
10	Isolated Ground	Isolated Ground
11	General Purpose Input 7	Control Input 15
12	General Purpose Input 8	Control Input 16
13	Isolated Ground	Isolated Ground
14	24V (60mA total, shared across all inputs)	24V (60mA total, shared across all inputs)

Connections and Input Types

External Connections

Both Chassis Ground (⏚) and Isolated Ground (⏚) are available on the IM-16 connectors.

By default, all input circuits are isolated with respect to the LSI-16 ground. Any external input connections must be logic referenced to the Isolated Ground. This configuration allows external equipment to be interconnected to the LSI-16 without ground current interaction between devices.

The IM-16 ground appears on a single terminal (Pin 1) on each of the two connector banks ('Option A' and 'Option B'). This should only be used if circuit isolation is not required and should only be connected to the cable screen.

The two issolated grounds of the IM-16 board are connected internally. For ease of wiring each connector, every Control Input pair has an Isolated Ground connection adjacent to it.

Types of Input Circuit

The logic level of each input on the IM-16 may be independently determined in the Vocia software to operate one of three ways. These are;

- TTL: 2V to 5V logic sense. To enable a TTL input, apply a TTL logic high with respect to Isolated Ground. This can be configured in software to detect a low to high or high to low transition.
- High Range: To enable a High Range input, use a dry contact to switch the input to a voltage of 24V DC with respect to Isolated Ground. This can be configured in software to detect a low to high or high to low transition.
- High Range – Monitored: This circuit is implemented in the same way as the 'High Range' input. This option allows monitoring of each input for short to ground and open circuit. In order to sense open circuit, a terminating resistor must be fitted between each Control Input and Isolated Ground at the far end of the input circuit being sensed. The IM-16 will sense open circuits on the line between its input and the terminating resistor. Shorts to Isolated Ground are sensed across the entire line being monitored. A 6k8Ω resistor should be used for each input. If a monitoring fault is detected on any input the logic state or transitions on that input will be ignored until the fault is cleared. High Range – Monitored inputs require a low to high transition to enable the input (transition direction not configurable).

System Fault Relay Connection

This relay is activated when the LSI-16/LSI-16e is fully operational. It may be used for informing external devices about the LSI-16/LSI-16e's operating conditions or sounding an alarm that indicates the LSI-16/LSI-16e is not functioning reliably.

RS232

The RS232 port can be used to send VTP commands to the LSI-16/LSI-16e and monitor Vocia system health. Please see Help Files for details.

24V DC Connector and LED

This is the primary (main) power supply input for the LSI-16 and as such must be fed from a suitable source of 24V DC capable of 15 watts (625mA). The 24V DC supply has to be sourced separately. In typical installations, this supply will be provided from a power supply compliant with local norms and required standards (typically battery-backed). The adjacent LED indicates the presence of power.

Sourcing 24V DC for High Range Inputs

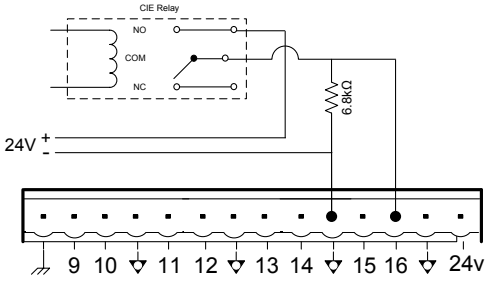
The High Range logic inputs should be driven from a contact closure (relay or switch) in connected equipment. The High Range inputs expect to sense a transition from low-state voltage (0-11V) to high-state voltage (12-30V). A 24V Logic High Reference output voltage is provided by the IM-16 for this purpose. Alternatively an external 24V reference may be used. If an external supply is used, the ground connection of the external supply must be wired to the IM-16 Isolated Ground.

IP30 Compliance

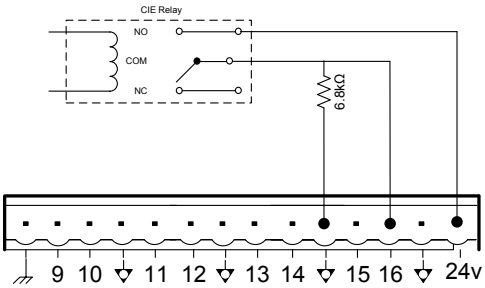
The LSI-16 is designed for ingress protection to the IP30 standard. In order to maintain this compliance, any unused terminal connectors on the back of the unit must be fitted with the supplied terminal blocks.

Suggested Alarm and Fault Input Connection Diagrams

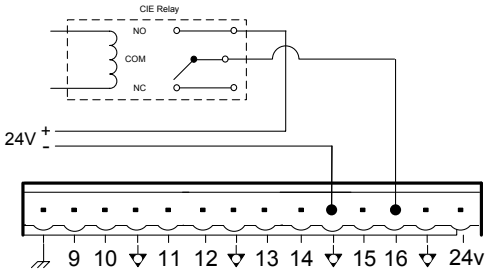
High Range Monitored
(24V provided externally)
Active State: High



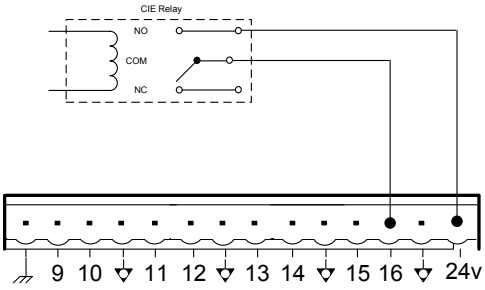
High Range Monitored
(24V provided by IM-16)
Active State: High



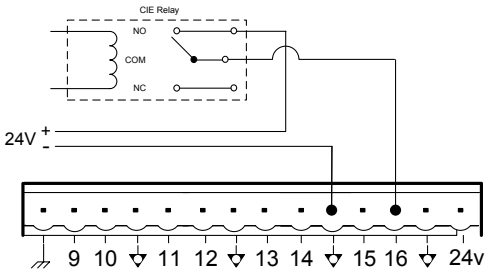
High Range Unmonitored
(24V provided externally)
Active State: High



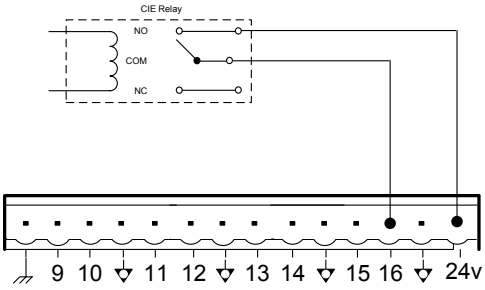
High Range Unmonitored
(24V provided by IM-16)
Active State: High



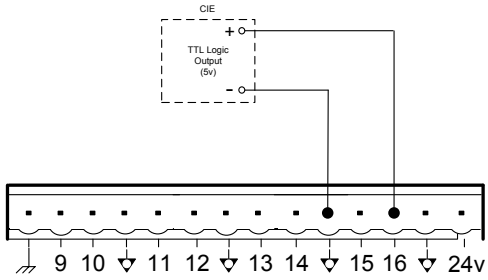
High Range Unmonitored
24V (External/CIE Provided)
Active State: Low



High Range Unmonitored
24V (IM-16 Provided)
Active State: Low



5V TTL Logic
Active State: Voltage Dependant



Installation

The LSI-16/LSI-16e requires one 1.75 inches (44.45mm) high and 19 inches (483mm) wide rack space with 10 inches (254mm) depth. Mounting the unit using four screws with washers will prevent marring of the front panel. PVC or nylon washers are appropriate.

Please install the unit away from heat sources, such as vents and radiators, and in rooms with adequate ventilation. Ensure that air can circulate freely behind, beside, and above the unit. Do not exceed the maximum ambient operating temperature of 32-113 degrees F (0-45°C). Be aware of conditions in an enclosed rack that may cause the temperature to exceed ambient room conditions.

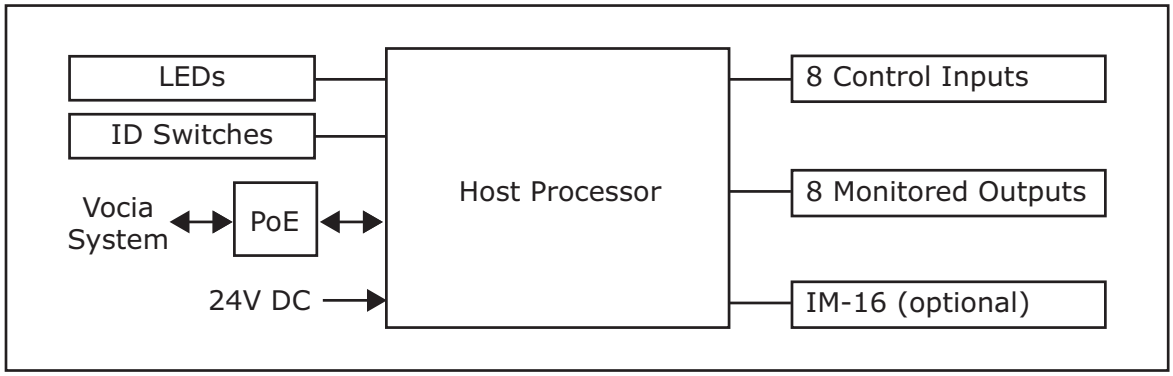
Note: To operate correctly, the LSI-16/LSI-16e requires input and output connections to external components and devices as described in this manual.

Life Safety Interface 16 SPECIFICATIONS

System Fault Relay:	
Type:	Single 'Form C' voltage-free SPST change-over contact
Load:	Resistive
Maximum operating voltage:	125VAC, 60VDC
Maximum operating current:	600mA AC, 1A DC
Maximum switching capacity:	37.5VA, 30W
Minimum permissible load:	10µA @ 10mVDC
Control Inputs:	
Number:	Eight
Type:	Opto Isolator LED
Cathode presented at input – pull low to enable. Sink Current:	
Min:	1mA
Max:	6mA
Maximum Terminal Voltage:	24V
Isolation:	3kV
Monitored I/O:	
Number:	Eight
Type:	FET switch, open drain (low side driver)
Maximum Continuous Current:	0.35A
Current Limit:	0.8A
Maximum External Supply:	35V
VMon Input Shutdown:	35V

RS232 Port	
Type:	DTE
Baud Rate:	57600
Connection:	RJ45 with shielded Ethernet/PoE cable (CAT5, CAT5e, CAT6, or CAT7)
Power:	
Main:	24V DC 15W
PoE:	802.3af Class 3
Base Dimensions:	
Height:	1.75 inches (44.5mm)
Width:	19 inches (483mm)
Depth:	10 inches (254mm
Weight:	Approx 6.4 lbs. (2.8kg)
Ambient Operating Temperature Range:	32-113 degrees F (0-45 degrees C)
Compliance:	FCC Part 15, class B EC marked EN 54-16 certified RoHS Directive UL 60065 Listed, E215636 C-UL Listed, E215636 C-Tick, N24138 (Australia)

Life Safety Interface 16 BLOCK DIAGRAM

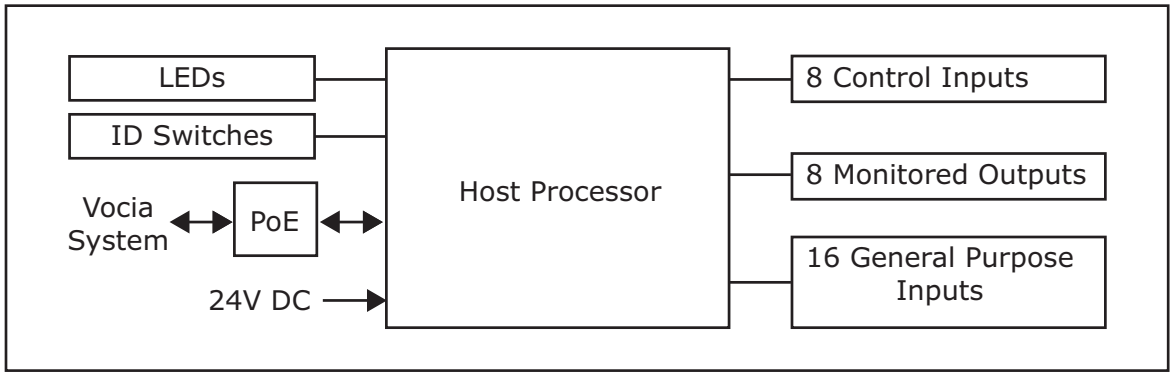


Life Safety Interface 16e SPECIFICATIONS

System Fault Relay:	
Type:	Single 'Form C' voltage-free SPST change-over contact
Load:	Resistive
Maximum operating voltage:	125VAC, 60VDC
Maximum operating current:	600mA AC, 1A DC
Maximum switching capacity:	37.5VA, 30W
Minimum permissible load:	10µA @ 10mVDC
Control Inputs:	
Number:	Eight
Type:	Opto Isolator LED
Cathode presented at input – pull low to enable. Sink Current:	
Min:	1mA
Max:	6mA
Maximum Terminal Voltage:	24V
Isolation:	3kV
Monitored I/O:	
Number:	Eight
Type:	FET switch, open drain (low side driver)
Maximum Continuous Current:	0.35A
Current Limit:	0.8A
Maximum External Supply:	35V
VMon Input Shutdown:	35V
Option Inputs:	
Number:	16
High Range Logic Low:	0-11 DC
High Range Logic High:	12-30 DC
High Range Hysteresis:	1V ± 20%
TTL Logic Low:	0-0.8V
TTL Logic High:	2-5V
TTL Hysteresis:	1V ± 20%
Input Transient Protection:	± 8KV peak
Input Isolation:	500V RMS (isolation from LSI-16)

RS232 Port	
Type:	DTE
Baud Rate:	57600
Connection:	RJ45 with shielded Ethernet/PoE cable (CAT5, CAT5e, CAT6 or CAT7)
Power:	
Main:	24V DC 15W
PoE:	802.3af Class 3
Base Dimensions:	
Height:	1.75 inches (44.5mm)
Width:	19 inches (483mm)
Depth:	10 inches (254mm
Weight:	Approx 6.4 lbs. (2.8kg)
Ambient Operating Temperature Range:	32-113 degrees F (0-45 degrees C)
Compliance:	FCC Part 15, class B CE marked EN 54-16 certification pending RoHS Directive UL 60065 Listed, E215636 C-UL Listed, E215636 C-Tick, N24138 (Australia)

Life Safety Interface 16e BLOCK DIAGRAM



BIAMP SYSTEMS IS PLEASED TO EXTEND THE FOLLOWING 5-YEAR LIMITED WARRANTY TO THE ORIGINAL PURCHASER OF THE PROFESSIONAL SOUND EQUIPMENT DESCRIBED IN THIS MANUAL

1. BIAMP Systems warrants to the original purchaser of new products that the product will be free from defects in material and workmanship for a period of 5 YEARS from the date of purchase from an authorized BIAMP Systems dealer, subject to the terms and conditions set forth below.

2 If you notify BIAMP during the warranty period that a BIAMP Systems product fails to comply with the warranty, BIAMP Systems will repair or replace, at BIAMP Systems' option, the nonconforming product. As a condition to receiving the benefits of this warranty, you must provide BIAMP Systems with documentation that establishes that you were the original purchaser of the products. Such evidence may consist of your sales receipt from an authorized BIAMP Systems dealer. Transportation and insurance charges to and from the BIAMP Systems factory for warranty service shall be your responsibility.

3. This warranty will be VOID if the serial number has been removed or defaced; or if the product has been altered, subjected to damage, abuse or rental usage, repaired by any person not authorized by BIAMP Systems to make repairs; or installed in any manner that does not comply with BIAMP Systems' recommendations.

4. Electro-mechanical fans, electrolytic capacitors, gooseneck microphones, cords connecting handheld microphones, hard-drives, displays, and normal wear and tear of items such as paint, knobs, handles, keypads and covers are not covered under this warranty. All server-based devices are warranted for 3 years only.

5. This warranty is in lieu of all other warranties, expressed or implied. Biamp Systems disclaims all other warranties, expressed or implied, including, but not limited to, implied warranties of merchantability and fitness for a particular purpose.

6. The remedies set forth herein shall be the purchaser's sole and exclusive remedies with respect to any defective product.

7. No agent, employee, distributor or dealer of BIAMP Systems is authorized to modify this warranty or to make additional warranties on behalf of BIAMP Systems. Statements, representations or warranties made by any dealer do not constitute warranties by BIAMP Systems. BIAMP Systems shall not be responsible or liable for any statement, representation or warranty made by any dealer or other person.

8. No action for breach of this warranty may be commenced more than one year after the expiration of this warranty.

9. BIAMP Systems shall not be liable for special, indirect, incidental, or consequential damages, including lost profits or loss of use arising out of the purchase, sale, or use of the products, even if BIAMP Systems was advised of the possibility of such damages.

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BIAMP®

DoC VLSI201101

CE

EC Declaration of Conformity

Biamp Systems Corporation, as manufacturer having sole responsibility, hereby declares that the following described product complies with the applicable provisions of the DIRECTIVES below except as noted herein. Any alterations to the product not agreed upon and directed by Biamp Systems Corporation will invalidate this declaration.

Product Model:	Vocia® LSI-16, LSI-16e	
Product Description:	Life Safety Interface for networking with audio DSPs	
Applicable EC Directives:	Applicable Harmonized Standards:	
LVD Directive (2006/95/EC)	Safety	EN 60065:2002
EMC Directive (2004/108/EC)	Emissions	EN 55103-1:1996, Environment E2
	Immunity	EN 55103-2:1996, Environment E2

Special Considerations for Product Environment or Compliance:

Use only CE marked Power over Ethernet (PoE) device.

Use only CE and “LPS” marked 24 VDC External Power Adaptor.

Shielded cabling must be used for system connections.

Technical Construction File, Location and Contact:

Biamp Systems Corporation	phone:	(503) 641.7287
9300 S.W. Gemini Drive	fax:	(503) 626.0281
Beaverton, OR USA 97008	e-mail:	biamp@biamp.com

Authorized Representative: Larry Copley, Compliance Engineer

Authorized Signature:

Revised: January 2011

EU RoHS COMPLIANT

This Biamp product, including all attendant cables and accessories supplied by Biamp, meets all requirements of EU Directives 2002/95/EC of January 27, 2003, and 2005/618/EC of August 18, 2005, the EU RoHS Directives. An EU RoHS Materials Content Declaration document may be obtained at www.biamp.com

(This information is presented to comply with the requirements of Chinese law SJ/T11363-2006)"

有害物质表

Biamp Systems Corporation

生命安全接口 (Life Safety Interface)

Vocia LSI-16, LSI-16e

部件名称	有毒有害物质或元素					
	Pb 铅	Hg 汞	Cd 镉	Cr+6 六价铬	PBB	PBDE
设备机箱 (Equipment Chassis)	X	O	X	O	O	O
插拔式接线端子 (Plug-in Terminal Blocks)	O	O	O	O	O	O
光盘(CD ROM)	O	O	O	O	O	O
手册和其他书面文档 (Manual and Documentation)	O	O	O	O	O	O
包装箱和所有包装材料 (Box and Packing Materials)	O	O	O	O	O	O

0：表示该部件所有均质材料中的这种有毒有害物质低于 SJ/T11363-2006 的限制要求.

X：表示该部件中至少有一种均质材料所含的这种有毒有害物质高于 SJ/T11363-2006 的限制要求.

在电触头和（或）镀镉所含的均质材料中，镉及其化合物的含量可以超过 0.01%，但欧盟指令 91/338/EEC（根据欧盟指令 76/769/EEC）限制销售和使用某些危险物质和制剂部分中所禁止的用途除外

在以下一种或多种物质所含的均质材料中，铅及其化合物的含量可以超过 0.1%:

1) 电子元器件中玻璃内所含的铅
2) 铅在钢材中是作为一种合金元素，含量可达 0.35%
3) 铅在铝材中是作为一种合金元素，含量可达 0.4%
4) 铅在铜材中是作为一种合金元素，含量可达 4%
5) 高熔点类焊料中的铅（即铅料合金，铅含量超过 85%）
6) 电子陶瓷部件内的铅
7) 由两种以上元素组成的焊料中所含的铅，用于连接针脚和微处理器包装，其中铅的含量超过 80% 但低于 85%
8) 顺应针连接系统内的铅
9) 倒装芯片封装中半导体芯片及载体之间形成可靠连接所用焊料中的

在正常使用情况下，中国环保使用期限为 10 年，条件是：

- 环境温度为 0-40C (32-104°F)
- 湿度为 0-95%，无凝结
- 海拔高度为 0-10,000 英尺
- 气流不受阻碍
- 没有水或其他液体进入任何部件
- 电源为 IEEE 802.3af PoE
- 部件没有损坏（损坏部件应立即修理）
- 由工厂授 ▪ 人 ▪ 使用批准的材料 ▪ 行所有 ▪ 修